Treating Penetrating Chest Trauma and Decompressing a Tension Pneumothorax

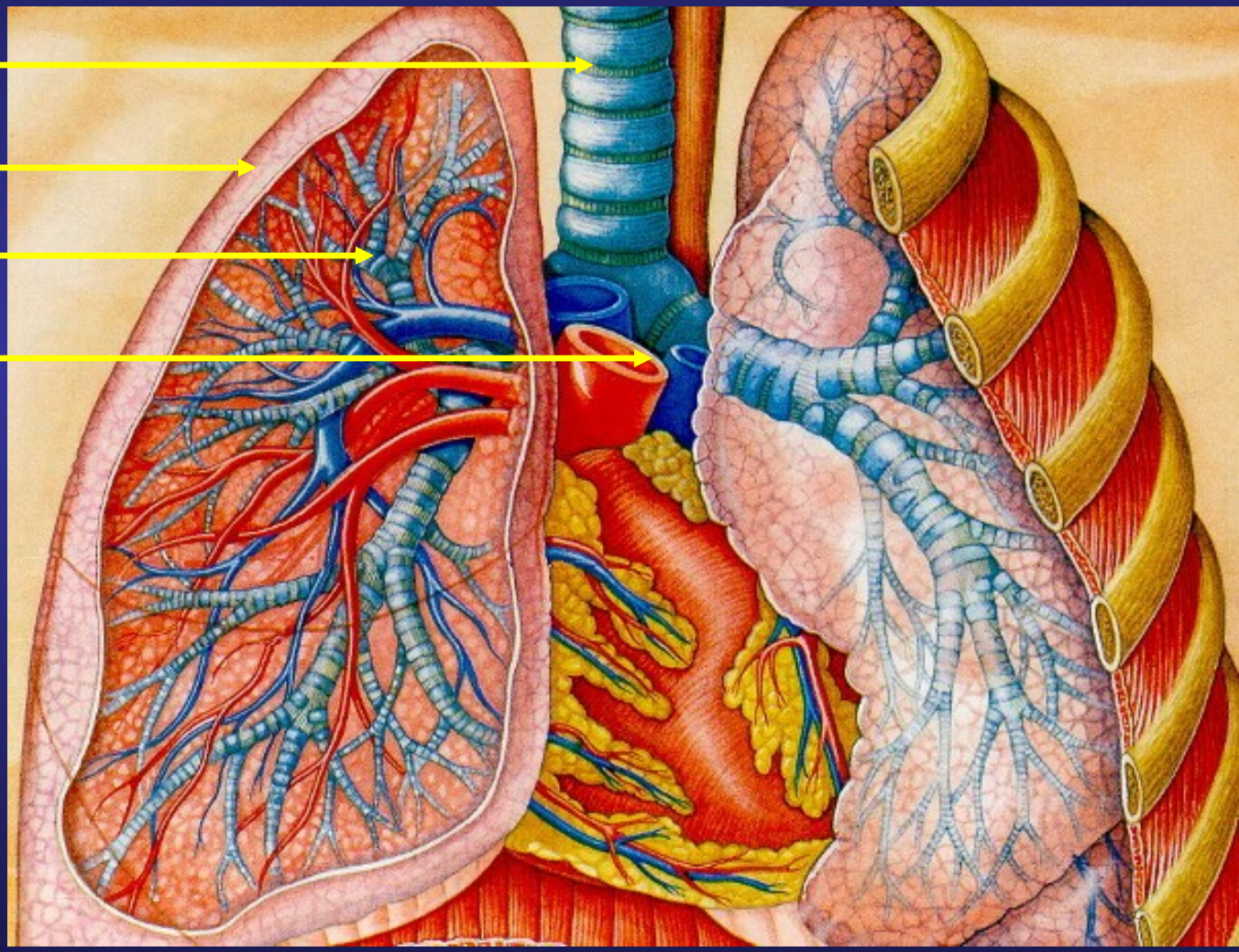
Introduction

- The body has two lungs, each enclosed in a separate airtight area within the chest. If a object punctures the chest wall and allows air to enter one of these areas, the lung within that area will begin to collapse.

- Any degree of collapse of either lung interferes with the casualty’s ability to breath and reduces the amount of oxygen available for use by the body.

Anatomy of the Thorax

- Trachea
- Lungs
- Bronchi
- Mediastinum

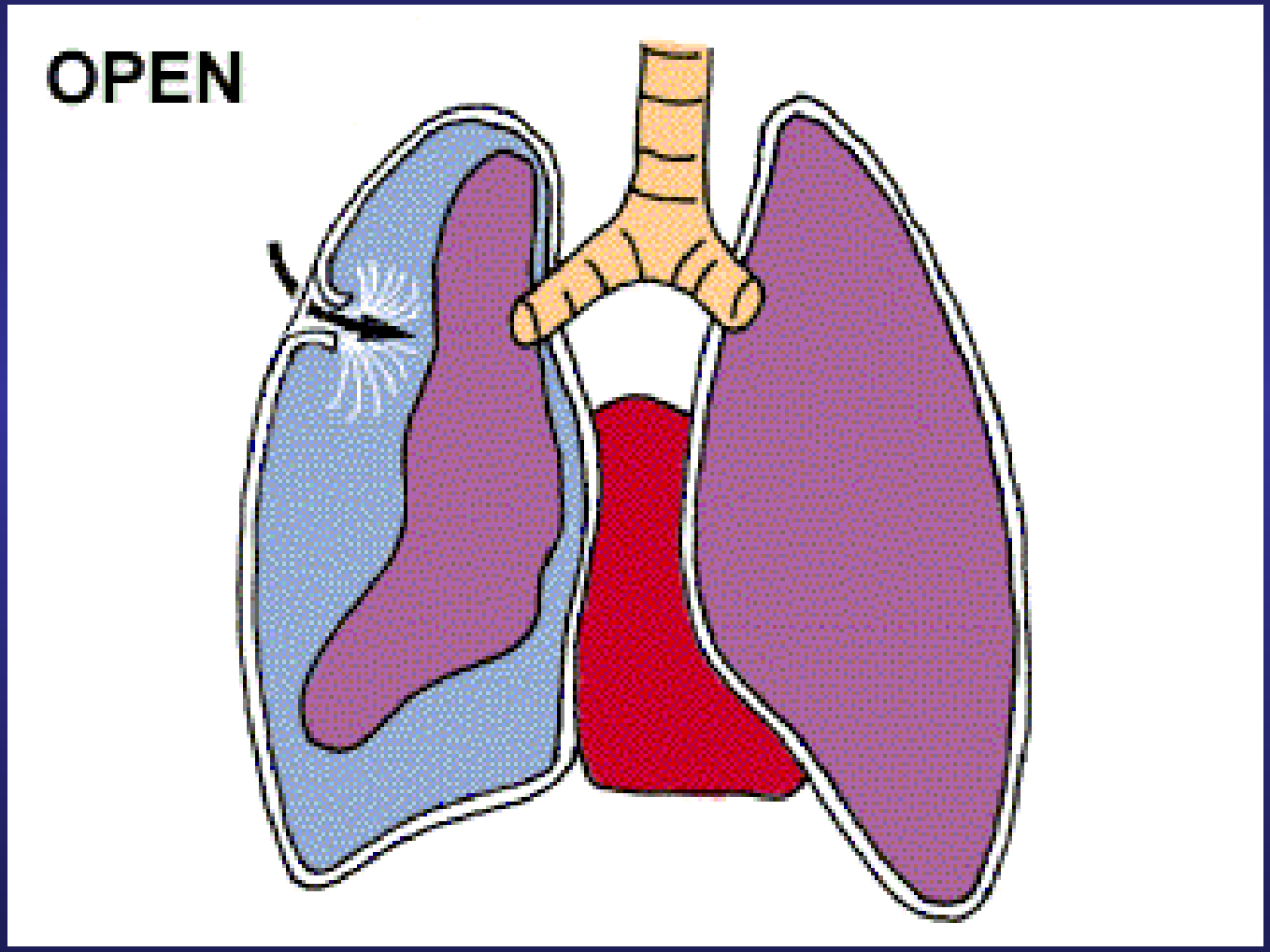


Open Chest Wound

- When an object penetrates the chest wall, the injury is called an open chest wound.

- Bullet
- Knife blade
- Shrapnel
- Stick
- Blast debris

Open Pneumothorax



Signs and Symptoms of an Open Chest Wound

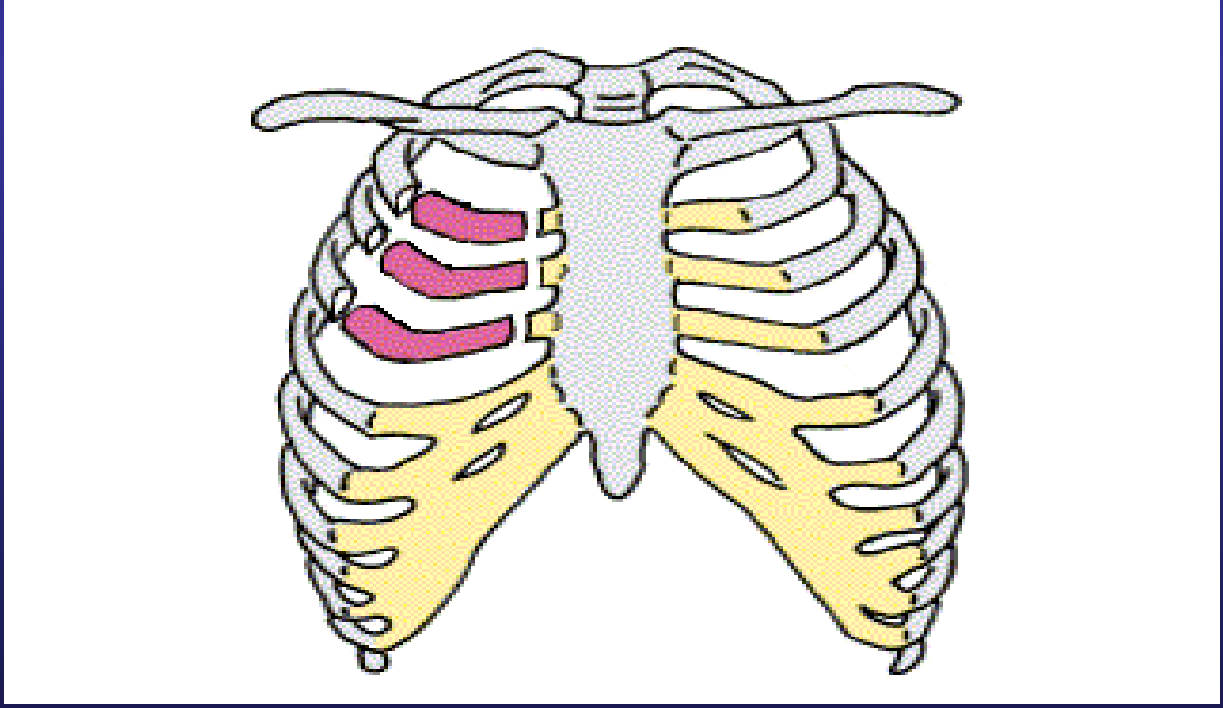
- Sucking or hissing sounds from wound “sucking chest wound”
- Casualty coughing up blood
- Frothy blood coming from wound
- Shortness of breath / Difficulty breathing

Signs and Symptoms of an Open Chest Wound

- Chest not rising normally during inhalation (fractured ribs, resulting in a flail chest)
- Pain in shoulder or chest that increases with breathing
- Bluish tint of lips, inside of mouth, fingertips, or nail beds caused by a decrease of oxygen in the blood (cyanosis)
- Rapid and weak heartbeat (shock)

Flail Chest

- Two or more adjacent ribs are fractured in at least two places or separation of sternum from ribs

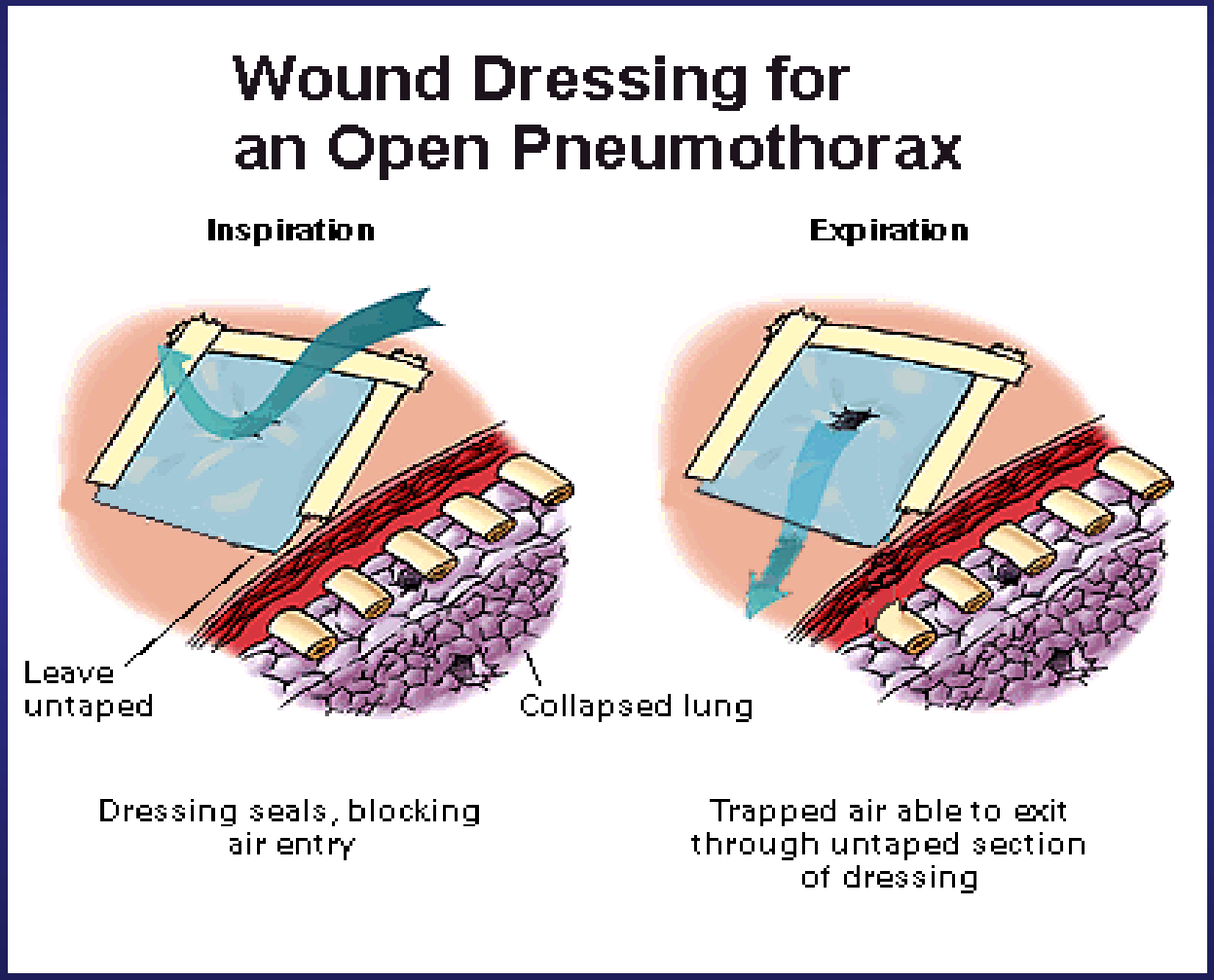


Cyanosis

Check for Open Chest Wounds

- Locate the open chest wound
- Check for entry and exit wound (look and feel)
- If entry and exit (same side), apply flutter-valve seal (three taped sides) to the wound on the front and a full seal (all four sides taped) to the wound on the back

Open Pneumothorax



Expose the Wound

- Expose the wound by removing, cutting, or tearing the clothing covering the wound
- Use scissors from aid bag, a knife , or a bayonet
- Do not remove clothing stuck to the wound
- Do not clean the wound or remove objects stuck in the wound

Prepare Sealing Material

Since air can pass through dressings and bandages, you must place airtight material over the chest wound before you dress and bandage the wound.

Plastic from a field dressing is one source of airtight material.

Flutter-Valve Seal

- Expose the wound
- Tell casualty to hold his breath
- Place inside surface of plastic wrapper directly over the hole
- Ensure airtight material extends at least two inches beyond the edges of the wound

Flutter-Valve Seal

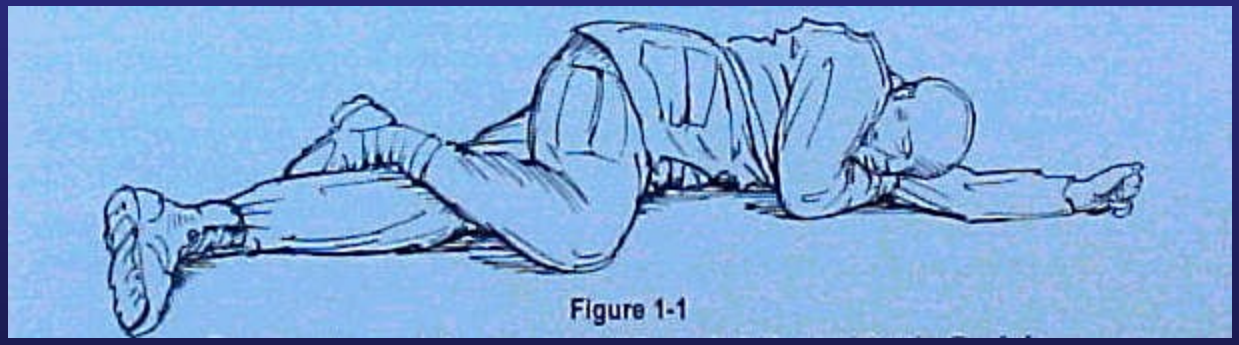
- Tape down three edges of airtight material (top edge and two sides) to create a “flutter valve” effect that allows air to escape from but not enter the chest cavity

- Tell the casualty to resume norma breathing

- Dress and bandage the wound to protect the airtight material from damage and protect the wound

Flutter-Valve Seal

Place the casualty in the recovery position with the injured side to the ground



Impaled Object

Impaled Object

- If the casualty is unconscious or cannot hold his breath, place the airtight material over the wound after the chest falls but before it rises.

- If the casualty is conscious and wants to sit upright, allow him to sit with his back against a tree or other supporting object.

Signs and Symptoms of Tension Pneumothorax

- Anxiety, agitation, and apprehension
- Diminished or absent breath sounds
- Cyanosis
- Rapid shallow breathing
- Distended neck veins

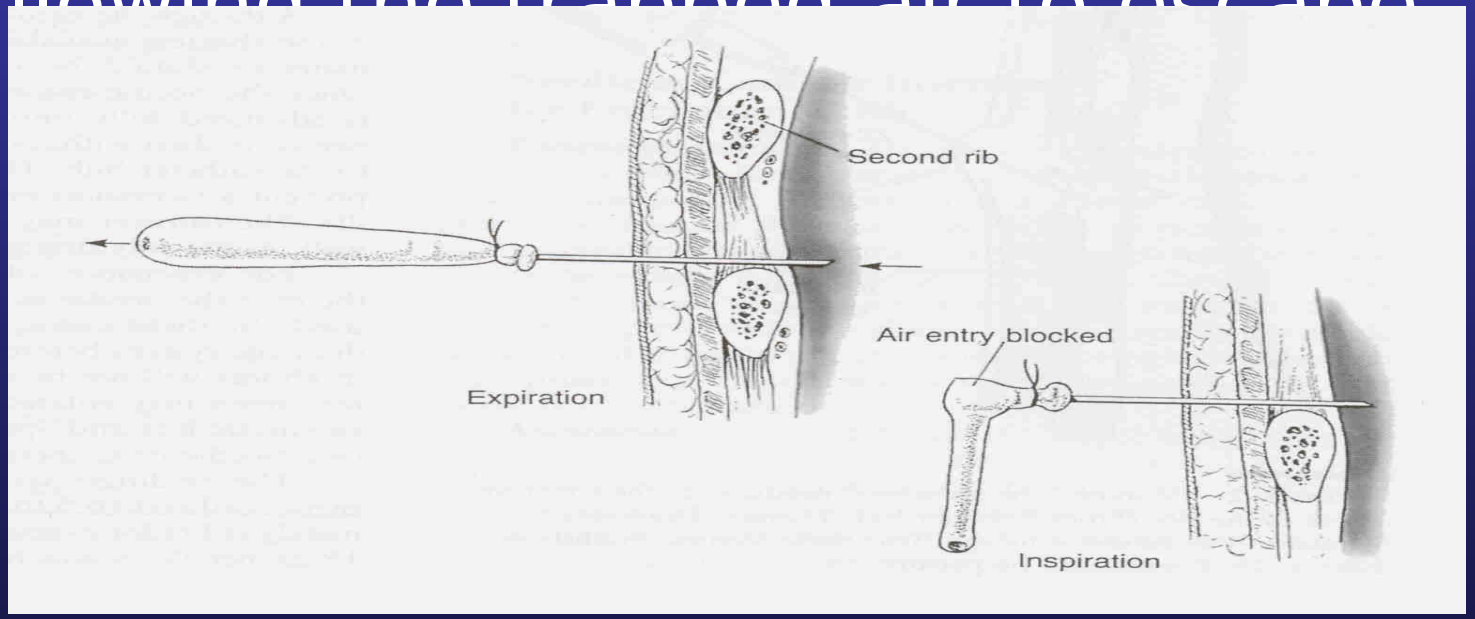
Signs and Symptoms of Tension Pneumothorax

- Abnormally low blood pressure (loss of radial pulse)
- Cool, clammy skin
- Decreased level of consciousness (AVPU)
- Visible deterioration of casualty's condition
- Tracheal deviation (shift of wind pipe)

Tracheal deviation is a late sign of tension pneumothorax and will probably not be observed.

Needle Chest Decompression

The buildup of trapped air in the casualty's chest can be relieved by puncturing the air pocket with a needle and catheter unit and allowing the trapped air to escape



Needle Chest Decompression

A needle chest decompression is performed **ONLY** if the casualty has a penetrating wound to the chest and increased difficulty breathing.

Performing a Needle Chest Decompression

Obtain a large bore (14 ga) needle and catheter unit and strip of tape from your aid bag.

Performing a Needle Chest Decompression

- Locate the insertion site: The second intercostal space just above the third rib at the mid-clavicular line (injury side).

Performing a Needle Chest Decompression

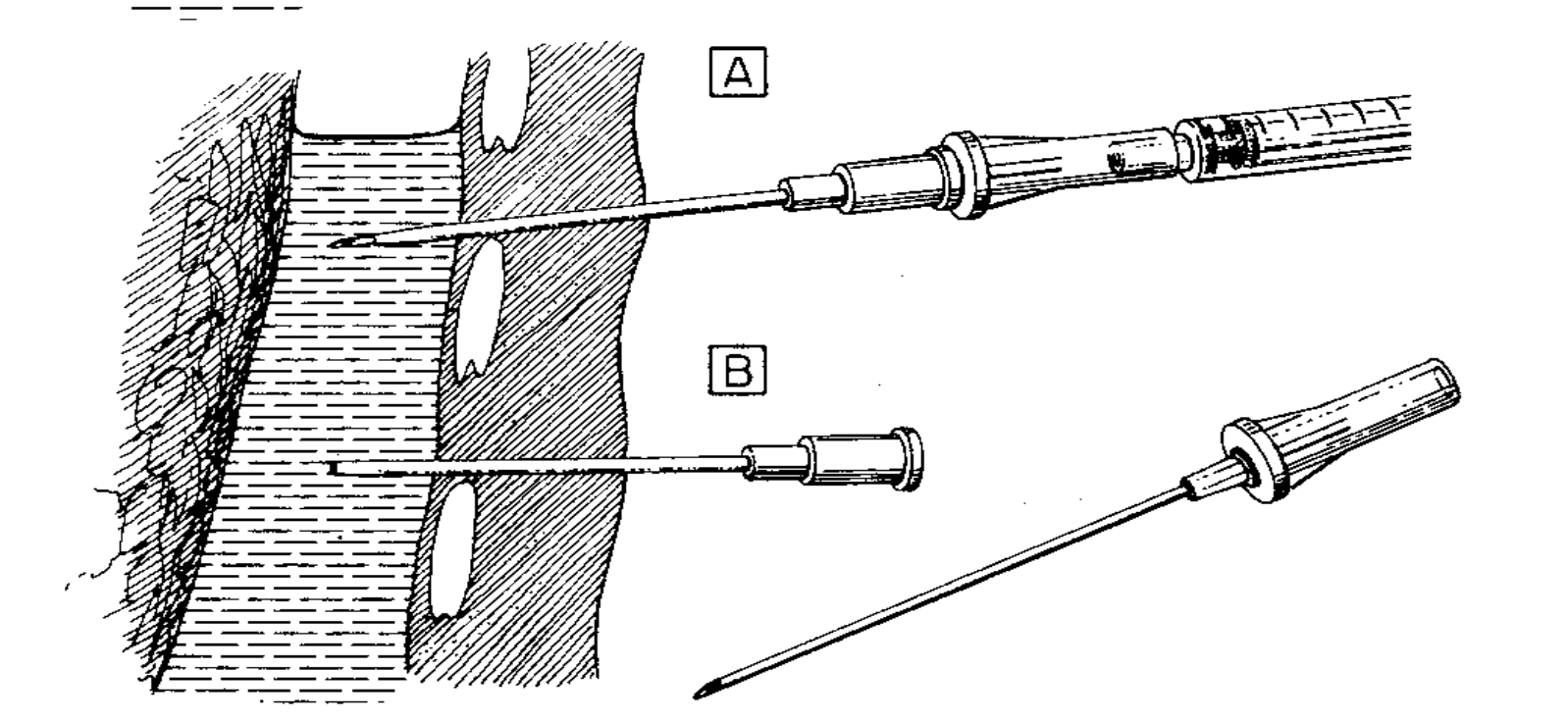
Firmly insert the needle into the skin at a 90 degree angle.

Performing a Needle Chest Decompression

- Insert the needle until the chest cavity is penetrated
- You will feel a “pop” as the needle enters the chest cavity

Performing a Needle Chest Decompression

Withdraw the needle while holding the catheter in place.



Performing a Needle Chest Decompression

Use the strip of tape to secure the catheter hub to the chest wall.

Additional Care

- If possible, monitor the casualty until medical care arrives.
- When the casualty is evacuated, he can be positioned on his side with the injured side up (opposite of open chest wound without needle decompression.
- Place the casualty in a sitting-up position if he finds that position more comfortable.

QUESTIONS?